REMARKS

Claims 58–104 remain in the present application, of which claims 58, 59, 70, 81, 92, 103, and 104 are independent. Claims 58–61, 63, 65, 68–70, 72, 74–83, 85–98, and 101–104 have been amended. New claims 105–108 have been added. No new matter is involved. Applicants respectfully respond to the Office Action.

Rejection of Claims 58-104 under 35 U.S.C. § 103(a)

Claims 58–59, 62–64, 66–68, 70, 73–75, 77–79, 81, 84–86, 88–90, 92, 95–97, 99–101, and 103–104 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Sanmugam (U.S. Pat. No. 5,533,094) in view of Miah et al. (EP 1617855).

Independent claims 58, 59, 70, 81, 92, 103, and 104, and dependent claims 63, 68, 75, 77–79, 85, 86, 88–90, 95–97, and 101 have been amended for clerical reasons unrelated to the patentability of these claims over the cited references.

The instant application has undergone a long series of rejections and amendments/responses over nearly six years, during which essentially a single point of contention appears to exist. Applicants hope that this response may clarify this point of contention such as to resolve any further disagreement.

The disagreement appears to be whether the cited references disclose a base station used in a centralized paging system, or an access node (e.g., base station) used in a distributed paging system as claimed. As explained below, Applicants submit that the cited references each disclose a centralized paging system, where incoming paging requests are processed by a centralized node, such as a mobile switching center (MSC; Sanmugam) or a radio network controller (RNC; Miah), before the paging requests are sent to the base station. The base station is then only disclosed in the cited references as buffering and/or broadcasting the paging messages. On the other hand, the instant claims each relate to an access node that includes certain modules for performing functions in lieu of processing at a central node. Applicants note that the "access node" in the instant claims may be, e.g., a base station. Page 6, first full paragraph, lines 9–10 of the specification as filed. Applicants further note that those skilled in

the art will understand that certain cellular communications standards such as the 3GPP UMTS standard refer to an access node as a "Node B."

Unlike a centralized paging system, in a distributed paging system that utilizes an access node as claimed, the determination of paging requirements is distributed to the access nodes themselves. As related in the instant specification, distributing this processing to the several access nodes provides flexibility in determining resource allocation with regard to paging operations. For example, the access node normally has more current information about limited airlink and other resources, which may change in relatively short order, than a centralized node. Therefore, the access node may utilize such current information to improve paging resource allocation decisions and/or prioritization of paging requests.

Beginning with the Applicants' Amendment of July 5, 2005, the claims were modified to emphasize functions performed by the access node in a distributed paging system. Further, Applicants' Amendment of June 25, 2008 included a full new set of claims to more clearly identify distributed paging where the access node includes modules for performing certain processing in lieu of that done by a centralized node. At least four intervening Office Actions have rejected all of the claims as either anticipated or obvious over Sanmugam and later Miah. In the instant Office Action of January 29, 2010, it is alleged that each of Sanmugam (page 3) and Miah (page 5) "discloses a system for distributed packet-based paging."

However, although the Office Action asserts that the cited references disclose systems for distributed packet-based paging, the Office Action fails to point to where either of these references discloses, teaches, or suggests an access node or base station having modules that perform the claimed functions appropriate for a distributed paging system. Rather, the Office Action only appears to point to portions of the cited references that indicate processing performed by a centralized node. Thus, Applicants respectfully traverse each of the rejections.

Independent claim 58 recites:

> A system for distributed packet-based paging, comprising:
> a plurality of access nodes configured to exchange paging information
> over corresponding access links, the plurality of access nodes serving a plurality
> of end nodes, each end node being associated with, and configured to receive a
> page from, at least one of the plurality of access nodes.

wherein each of the plurality of access nodes comprises at least one of a paging requirements determination module and a paging resource control module,

wherein each paging requirements determination module is configured to determine paging requirements to send to the paging resource control module in communication with an intended end node of the page, the paging requirements being determined at least in part (i) from analyzing at least one of a header field or a payload field, using a packet classification technique, from a data message received over a corresponding access link and (ii) from stored information uniquely associated with the access node in which the paging requirements determination module resides, and

wherein each paging resource control module is configured to provide paging resource control functionality in accordance with the paging requirements received from the paging requirements determination module, where the paging resource control functionality includes controlling at least one of (i) paging resources, (ii) paging operations, or (iii) the generation of pages to the intended end node.

Applicants submit that the cited references, in any combination, do not disclose, teach, or suggest the recitations of claim 58. Thus, there is no apparent reason why one of ordinary skill in the art at the time when the invention was made would have combined the disclosures of the cited references to arrive at claim 58.

In rejecting claim 58, on pages 3–4, with respect to the PRD module, the Office Action refers only to the base station 256 of Sanmugam and cites col. 4, lines 66–col. 5, line 13; col. 5, lines 40–45; col. 7, lines 8–15; col. 8, lines 1–9; col. 9, line 2; col. 13, lines 1–32; and FIGs. 1, 8A–B, and 9. Applicants do not find in the Office Action any articulation how these scattered segments of Sanmugam are equated to each and every portion of the described PRD module. However, after reviewing the cited segments and indeed the entire disclosure of Sanmugam, Applicants respectfully traverse this rejection, at least because the cited segments of Sanmugam do not disclose an access node (e.g., base station) having a paging requirements determination module that determines paging requirements as claimed.

Sanmugam discloses base stations B1–B10, mobile stations M1–M10, and mobile switching centers MSC in FIG. 1. According to the disclosure of Sanmugam, various mobile stations may be allotted various classes of service. Col. 7, lines 8–15. To improve the page response rate, Sanmugam defines the relative importance of various page attempts, e.g., according to the classes of service, so that incoming page requests receive paging service in

accordance with their relative importance. Col. 8 lines 1–9. The assignment of paging priorities may be based in part on page request characteristics. Col. 9, line 2.

As illustrated in FIGs. 8A–B, Sanmugam discloses various processing of incoming page requests prior to, in block 208, the paging orders being transmitted to a base station. At the control channel within the base station, the page message is placed in appropriate buffers according to the paging priority as determined by the MSC, and the page messages are then broadcasted according to those priorities. Col. 12, lines 29–40.

FIG. 9 and its associated description at col. 13 lines 1–32 further illustrate Sanmugam's prioritization of paging messages. As is clear from this description, from that associated with FIGs. 8A–8B, and the above review of Sanmugam as a whole, Sanmugam discloses a centralized paging system, where the determination of the priority of paging messages is performed by a centralized network node, e.g., the MSC, and the processed and prioritized paging messages are only then provided to the base stations.

On page 5, the Office Action cites Miah as allegedly providing "further support" of the rejection of claim 58. In fact, Miah discloses a centralized paging system similar to the one in Sanmugam, wherein a radio network controller (RNC) includes a paging message construction unit that constructs and prioritizes paging messages. These paging messages are thereby provided to a buffer unit that provides the messages to the Node B, which then broadcasts the paging messages. See ¶ [0012], [0016]. Thus, Miah as a whole also fails to disclose an access node (e.g., Node B) having a paging requirements determination module that determines paging requirements as claimed.

On the other hand, claim 58 relates to distributed packet-based paging, that is, where certain functions are performed by the access nodes rather than at a centralized location such as the MSC in Sanmugam or the RNC in Miah. For example, claim 58 includes access nodes comprising a paging requirements determination module configured to determine paging requirements, in part, using two elements, designated by (i) and (ii).

Here, the paging requirements determination module determines paging requirements, in part, from analyzing at least one of a header field or a payload field, using a packet classification technique, from a data message received over a corresponding one of the access links.

The paging requirements determination module further determines the paging requirements, in part, from stored information uniquely associated with the access node in which the PRD module resides.

Importantly, the paging requirements determination module as claimed is a part of the access node. While the Office Action equates the base station 256 of Sanmugam with the access node, in fact, as described above, nowhere does Sanmugam disclose, teach, or suggest that its base station 256 includes a module configured to determine paging requirements as claimed. Rather, as already discussed, Sanmugam only appears to disclose an MSC that determines priorities of paging messages. Similarly, the Office Action equates the Node B 16 of Miah with the claimed access node, however, nowhere does Miah disclose, teach, or suggest that its Node B 16 includes a module configured to determine paging requirements. Rather, Miah only appears to disclose an RNC 12 that determines priorities of paging messages.

Moreover, the cited references fail to disclose, teach, or suggest the specifics of the two elements (i) and (ii) associated with the paging requirements determination module of claim 58. With respect to the header field or payload field, the Office Action at page 5 claims that Sanmugam "inexplicitly" discloses this feature, and asserts that Miah discloses this feature. While Applicants agree that Miah uses the word "header," it is nonetheless submitted that the cited references both fail to disclose, teach, or suggest a paging requirements determination module, within the access node, configured to determine the paging requirements, in part, from analyzing at least one of a header field or a payload field from a data message received over an access link.

In Miah ¶ [0012], it is clear that the RNC includes the "paging header generator means" that supplies a header to paging messages, and reading means to read the headers of the paging messages and to direct the accompanying paging message to a buffer unit for onward transmission by the Node B. Similarly, in Sanmugam, the MSC provides its paging messages to its base stations B1–B10, which then store and broadcast the paging messages.

Thus, the cited references do not teach an access node that includes a paging requirements determination module configured to determine paging requirements as claimed. Nor do the cited

references teach an access node that includes a paging requirements determination module configured to analyze at least one of a header field or a payload field from a data message.

For at least these reasons, claim 58 would not have been obvious over any combination of Sanmugam and Miah at the time the invention was made. Therefore, Applicants request that the rejection of claim 58 be withdrawn and that this claim be allowed.

Independent claim 59 recites, in a relevant portion, "An access access node for use in a system for distributed packet-based paging, comprising: a paging requirements determination module . . . wherein the paging requirements determination module is configured to determine paging requirements . . ."

Independent claim 70 recites, in a relevant portion, "A method for communicating paging information in a system for distributed packet-based paging, comprising: . . . providing the access node comprising at least one of a paging requirements determination module . . . determining, by the paging requirements determination module, paging requirements . . ."

Independent claim 81 recites, in a relevant portion, "A computer program product comprising: a computer readable medium comprising instructions for . . . providing a page to at least one of a plurality of end nodes . . . determining, by a paging requirements determination module in an access node of the plurality of access nodes, paging requirements . . ."

Independent claim 92 recites, in a relevant portion, "An access node for use in a system for distributed packet-based paging, comprising: . . . means for determining paging requirements . . ."

Independent claim 103 recites, in a relevant portion, "An end node for use in a system for distributed packet-based paging, comprising: means for receiving a first page from a first access node having a first paging resource control module . . . wherein . . . each of the first and second paging requirements determination modules is configured to determine paging requirements . . . "

Independent claim 104 recites, in a relevant portion, "A method for receiving a page in a system for distributed packet-based paging, comprising: receiving a first page from a first access node having a first paging resource control module . . . wherein each of the first and second paging requirements determination modules is configured to determine paging requirements . . . "

For at least reasons that are substantially the same as those given above in reference to claim 58, any combination of Sanmugam and Miah does not disclose, teach, or suggest the above recitations of claims 59, 70, 81, 92, 103, or 104, and there is no apparent reason why one skilled in the art would have arrived at the claimed embodiment by combining the teachings of Sanmugam and Miah. Therefore, claims 59, 70, 81, 92, 103, and 104 would not have been obvious over Sanmugam and Miah at the time the invention was made. Therefore, Applicants request that the rejection of claims 59, 70, 81, 92, 103, and 104 be withdrawn and that these claims be allowed.

Because claims 62–64 and 66–68 depend, directly or indirectly, from claim 59; claims 73–75 and 77–79 depend, directly or indirectly, from claim 70; claims 84–86 and 88–90 depend, directly or indirectly, from claim 81; and claims 95–97 and 99–101 depend, directly or indirectly, from claim 92, they each incorporate all the terms and limitations of their respective independent claim in addition to other limitations, which together further patentably distinguish these claims over the art of record when considered as a whole. Therefore, Applicants request that the rejection of claims 62–64, 66–68, 73–75, 77–79, 84–86, 88–90, 95–97, and 99–101 be withdrawn and that these claims be allowed.

Claims 60, 71, 82 and 93 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Sanmugam in view of Miah as applied to claims 59, 70, 81, and 92 above, and further in view of Palat et al. (U.S. Pat. No. 6,765,890).

Dependent claims 60, 71, 82, and 93 were amended for clerical reasons unrelated to the patentability of these claims over the cited references.

Palat was cited only for its alleged disclosure related to "the feature(s) received location update signals." (sic) Applicants respectfully submit that Palat fails to make up for the deficiencies of Sanmugam and Miah as described above. Further, because claims 60, 71, 82, and 93 depend, directly or indirectly, from independent claim 59, 70, 81, or 92, respectively, they each incorporate all the terms and limitations of their respective independent claim in addition to other limitations, which together further patentably distinguish these claims over the art of record when considered as a whole. Therefore, Applicants request that the rejection of claims 60, 71, 82 and 93 be withdrawn and that these claims be allowed.

Claims 61, 72, 83 and 94 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Sanmugam in view of Miah as applied to claims 59, 70, 81, and 92 above, and further supported by Wallentin et al. (U.S. Pat. No. 6,834,191).

Dependent claims 61, 72, 83, and 94 were amended for clerical reasons unrelated to their patentability over the cited references.

Wallentin was cited only for its alleged disclosure related to "the feature(s) a local paging agent module that coordinates signaling between the PRD module and other access nodes." Applicants respectfully submit that Wallentin fails to make up for the deficiencies of Sanmugam and Miah as described above. Further, because claims 61, 72, 83, and 94 depend, directly or indirectly, from claim 59, 70, 81, or 92, respectively, they each incorporate all the terms and limitations of their respective independent claim in addition to other limitations, which together further patentably distinguish these claims over the art of record when considered as a whole. Therefore, Applicants request that the rejection of claims 61, 72, 83 and 94 be withdrawn and that these claims be allowed.

Claims 65, 76, 87 and 98 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Sanmugam in view of Miah as applied to claims 64, 75, 86, and 97 above, and further in view of Laroia et al. (U.S. Pat. No. 6,823,191).

Dependent claims 65, 76, 87 and 98 were amended for clerical reasons unrelated to their patentability over the cited references.

Laroia was cited only for its alleged disclosure related to "the feature(s) wherein the page transmission timing constraint indicates paging latency information and specifies an upper bound on paging delay." Applicants respectfully submit that Laroia fails to make up for the deficiencies of Sanmugam and Miah as described above. Further, because claims 65, 76, 87, and 98 depend, directly or indirectly, from claim 59, 70, 81, or 92, respectively, they each incorporate all the terms and limitations of their respective independent claim in addition to other limitations, which together further patentably distinguish these claims over the art of record when considered as a whole. Therefore, Applicants request that the rejection of claims 65, 76, 87 and 98 be withdrawn and that these claims be allowed.

Claims 69, 80, 91 and 102 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Sanmugam in view of Miah as applied to claims 59, 70, 81, and 92 above, and further in view of Weber et al. (U.S. Pat. No. 6,314,282).

Dependent claims 69, 80, 91 and 102 were amended for clerical reasons unrelated to their patentability over the cited references.

Weber was cited only for its alleged disclosure related to "the feature(s) wherein the determined paging requirements includes information indicating a state of device operation in which a mobile terminal (7) which reads on the claimed 'end node' to which the page is directed is to operate after receiving the page." Applicants respectfully submit that Weber fails to make up for the deficiencies of Sanmugam and Miah as described above. Further, because claims 69, 80, 91, and 102 depend, directly or indirectly, from claim 59, 70, 81, or 92, respectively, they each incorporate all the terms and limitations of their respective independent claim in addition to other limitations, which together further patentably distinguish these claims over the art of record when considered as a whole. Therefore, Applicants request that the rejection of claims 69, 80, 91, and 102 be withdrawn and that these claims be allowed.

Conclusion

In view of the foregoing amendments and remarks, Applicants believe the application is in condition for allowance. Reconsideration and early allowance are respectfully requested. If there are any remaining issues that can be addressed over the telephone, the Examiner is cordially invited to call Applicants' attorney at the number listed below.

In the event of any fees that may be due or any overpayments that may be associated with this response, please charge or deposit the amount to Deposit Account No. 17-0026.

Respectfully submitted,

Dated: April 21, 2010

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